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Risk of Malignancy Following Radiofrequency Ablation of Thyroid Nodules

Radiofrequency ablation (RFA) is a safe and effective treatment of symptomatic benign thyroid nodules. However, some publications have cautioned against the use of RFA in Bethesda III, IV, and V thyroid nodules due to risk of developing follicular thyroid cancer. Unfortunately, these studies lack in statistical power due to small sample size. We aim to investigate the pathological changes following RFA of Bethesda III, IV, and V thyroid nodules.

Patients treated by RFA with pre-operative and post-operative fine needle aspiration (FNA) were included. Nondiagnostic nodules were subsequently subjected to ThyGeNEXT and ThyraMIR testing. The FNA results following RFA were compared against the two FNA biopsies prior to ablation. The repeat FNA occurred between 1 and 24 months after ablation. Surgery was offered to patients when indicated and final pathology was recorded.

A total of 74 thyroid nodules were included. At baseline, 21 nodules were nondiagnostic, 37 nodules were benign, and 16 nodules were either Bethesda III, IV, or V. Of the 37 benign nodules, 35 (94.6%) remained benign on repeat FNA and 2 (5.4%) became nondiagnostic with no mutation detected following molecular and genetic testing. Of the 21 baseline nondiagnostic nodules which were proven benign by ThyGeNEXT and ThyraMIR prior to ablation, 17 (81%) were benign on repeat FNA and 4 (19%) remained nondiagnostic with no mutation detected. Of the 16 Bethesda III, IV, and V nodules, 6 (37.5%) were benign on repeat FNA, 1 (6.3%) was nondiagnostic on repeat FNA, and 9 (56.2%) remained Bethesda III, IV, and V nodules with no mutation detected on molecular and genetic testing. Among the 5 patients with Bethesda III, IV, and V nodules who had surgery, 4 (80%) were benign and 1 (20%) was papillary thyroid carcinoma on surgical pathology. No patients had follicular carcinoma.

Following RFA, the majority of nodules (98.6%) were benign by FNA or surgical pathology. RFA does not increase the risk of follicular carcinoma in Bethesda III, IV, and V thyroid nodules.